

Supplementary Materials

Figure S1: Confirmation of recombination by PCR analysis. (A) Schematic of genomic locus. The *Dicer^{fllox}* mouse carries loxP sites flanking exon 24, that encodes most of the second RNaseIII domain of the *Dicer1* gene. Primers *DicerF1* and *DicerDel* produce a fragment of 601 nt length. (B) Gel picture of the recombined *Dicer* fragment detected in the olfactory bulb of the knockout (KO) animal but not in the ear. * unspecific bands that were amplified in all samples. (C) RT-qPCR confirmation of recombination in the conditional knockout model. Left panel shows expression of exon 21 normalized to reference genes. Middle panel shows splicing level of exon 23 onto 25. Right panel shows exon 23-25 splicing level normalized to the expression of exon 21. Average expression in controls were set to 1.

Figure S2: (A) Histogram of daily onset time under LD 12:12 in comparison to ZT12 (set at 0). Daily onset time for all animals were shown (n = 10 for control, n = 5 for KO). Each animal had at least 10 days of recording. (B) Examples of onset detection (red circles) in KO and control mice. Activities were recorded using infrared detectors. Onsets of the first three days were omitted to avoid artefacts caused by previous light schedule. (C) Histogram of daily onset time under DD in comparison to CT12 (set at 0). Daily onset time for all animals were shown (n = 22 for control, n = 14 for KO). Each animal had at least 10 days of recording.

Figure S3: Actograms and periodograms of all control (A) and knockout (B) animals under constant light condition (LL).

Figure S4: Knockout phenotype under LL correlates with their clock precision evaluated by onset variations. (A) Absolute difference to CT12 under DD. (B) Standard deviation of difference to CT12 under DD.

Figure S5: Actograms and periodograms of all control (A) and knockout (B) animals under LD 3:3. Yellow part denotes when light was on.

Figure S6: Actograms and periodograms of all control (A) and knockout (B) animals for the inducible knockout model. Yellow part denotes when light was on.

Figure S7: RT-qPCR confirmation of recombination in the inducible knockout model. (A) Expression of exon 21 normalized to reference genes. (B) Splicing level of exon 23 onto 25. (C) Exon 23-25 splicing level normalized to the expression of exon 21.

Figure S8: Confirmation of Cre injection. (A) Representative of mCherry expression in a control brain slice. (B) Representative of mCherry expression in a missed Cre injection. (C) mCherry expression in a Cre-injected animal with period length of 22.58 h under DD. (D) Representative of mCherry expression in a Cre injected animal with period length of 24.25 h. (E) Representative of mCherry expression in a Cre injected animal with arrhythmicity.

Figure S9: Altered SCN structure in conditional knockout animals. (A) DAPI staining of control brain slices. (B) DAPI staining of conditional knockout brain slices.

Figure S10: Gender differences in phenotypes of knockout animals. (A) Female KO were extremely overweighted. Left: control, right: KO female. (B) Period length of

tissue explants from control and KO females. Tissue explants from the same animals share the same colors and are connected by lines.

Figure S1

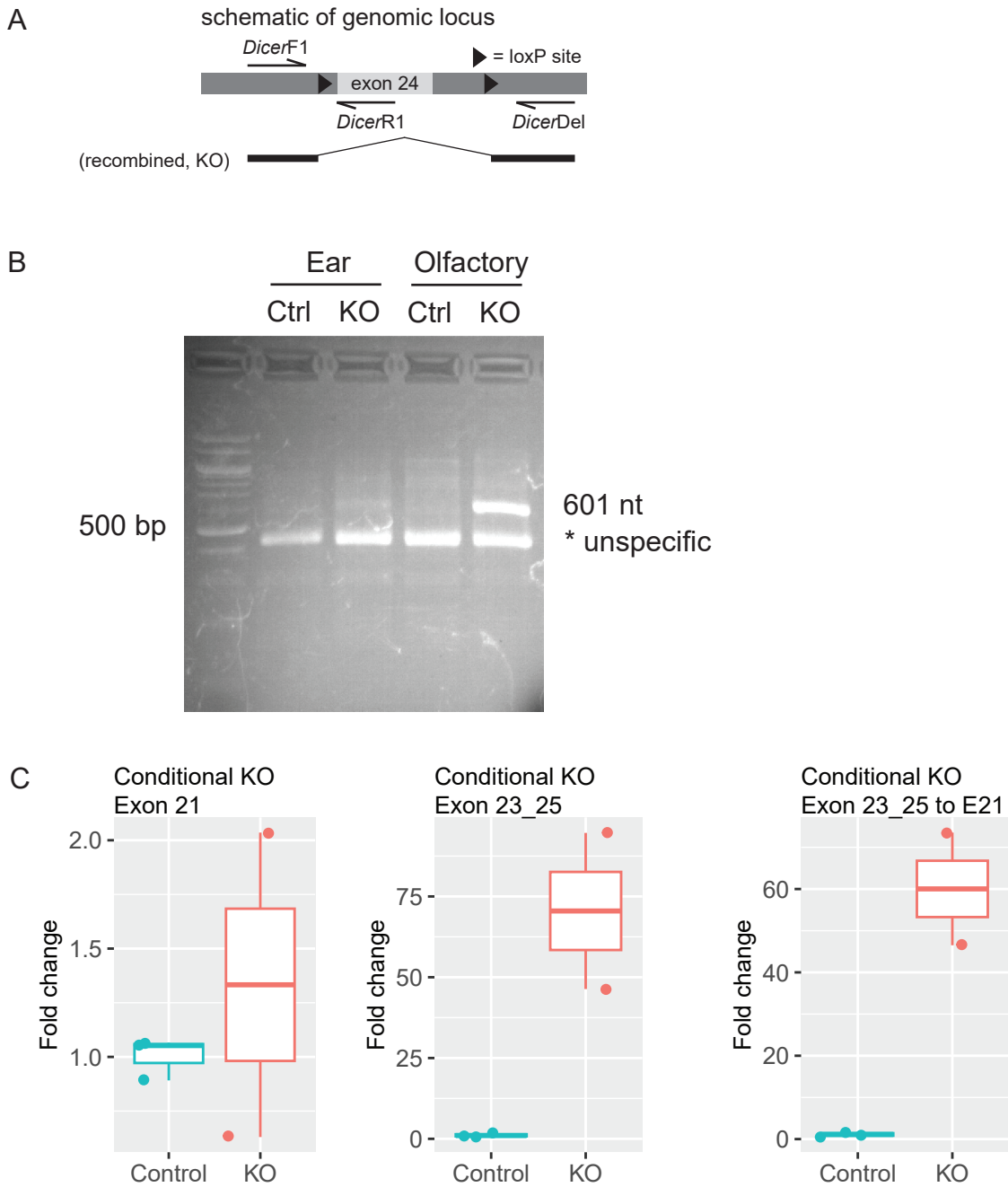


Figure S2

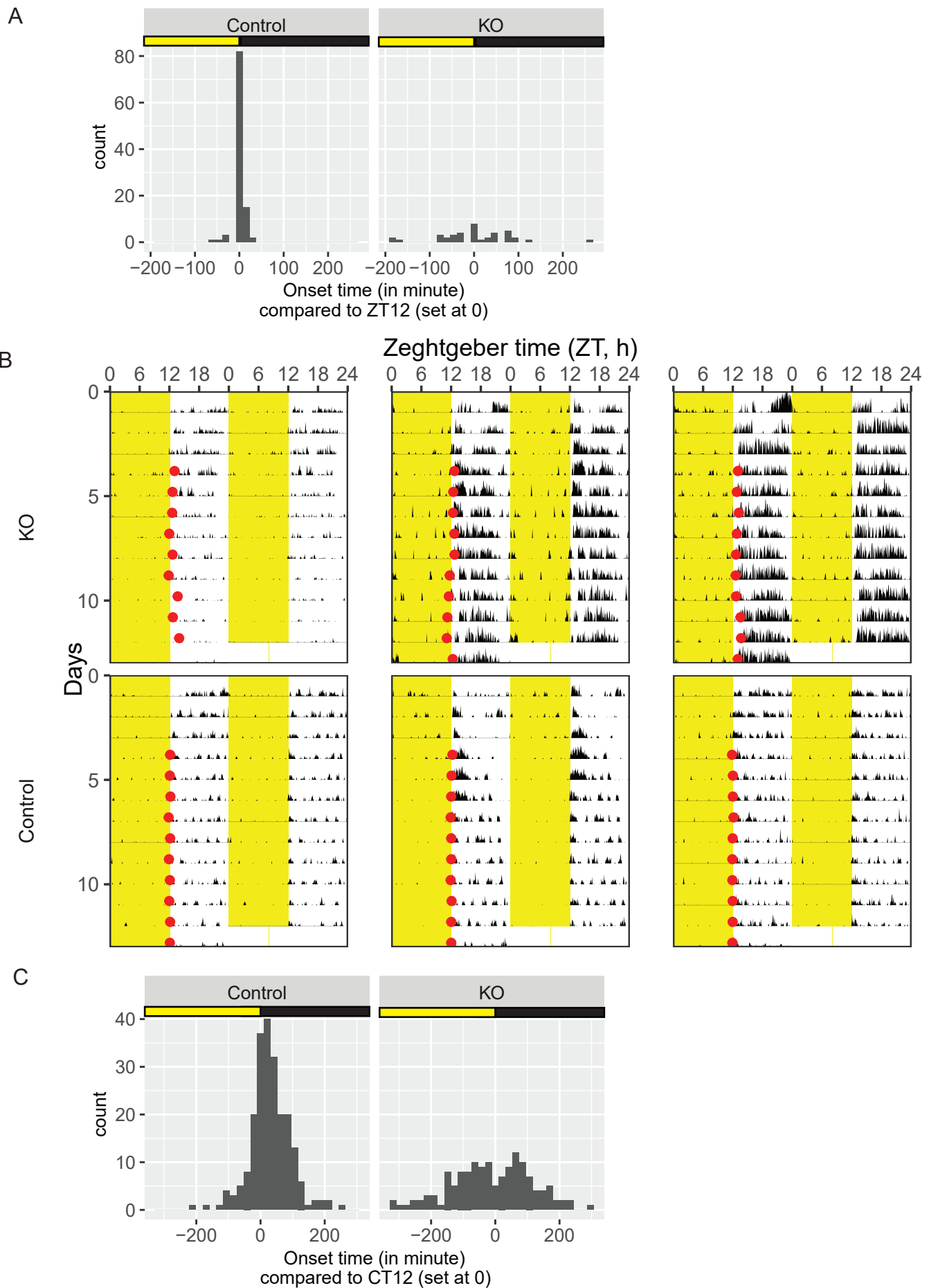


Figure S4

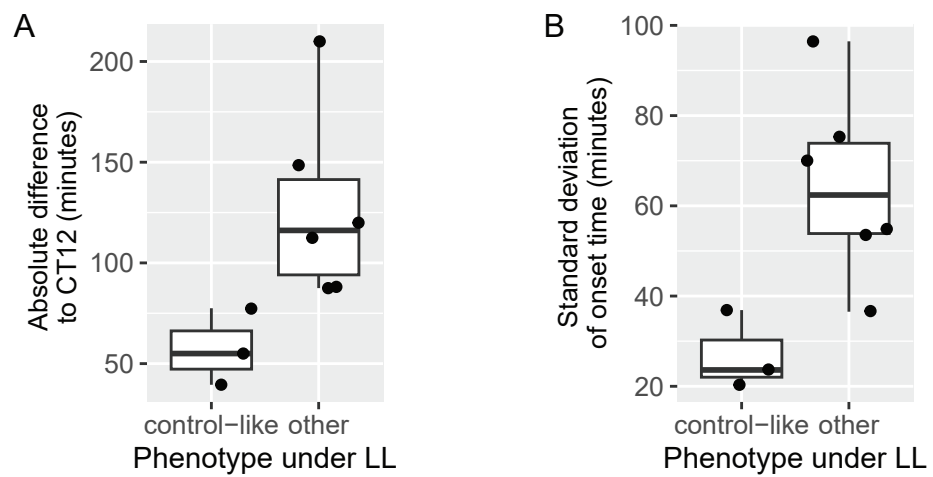


Figure S5

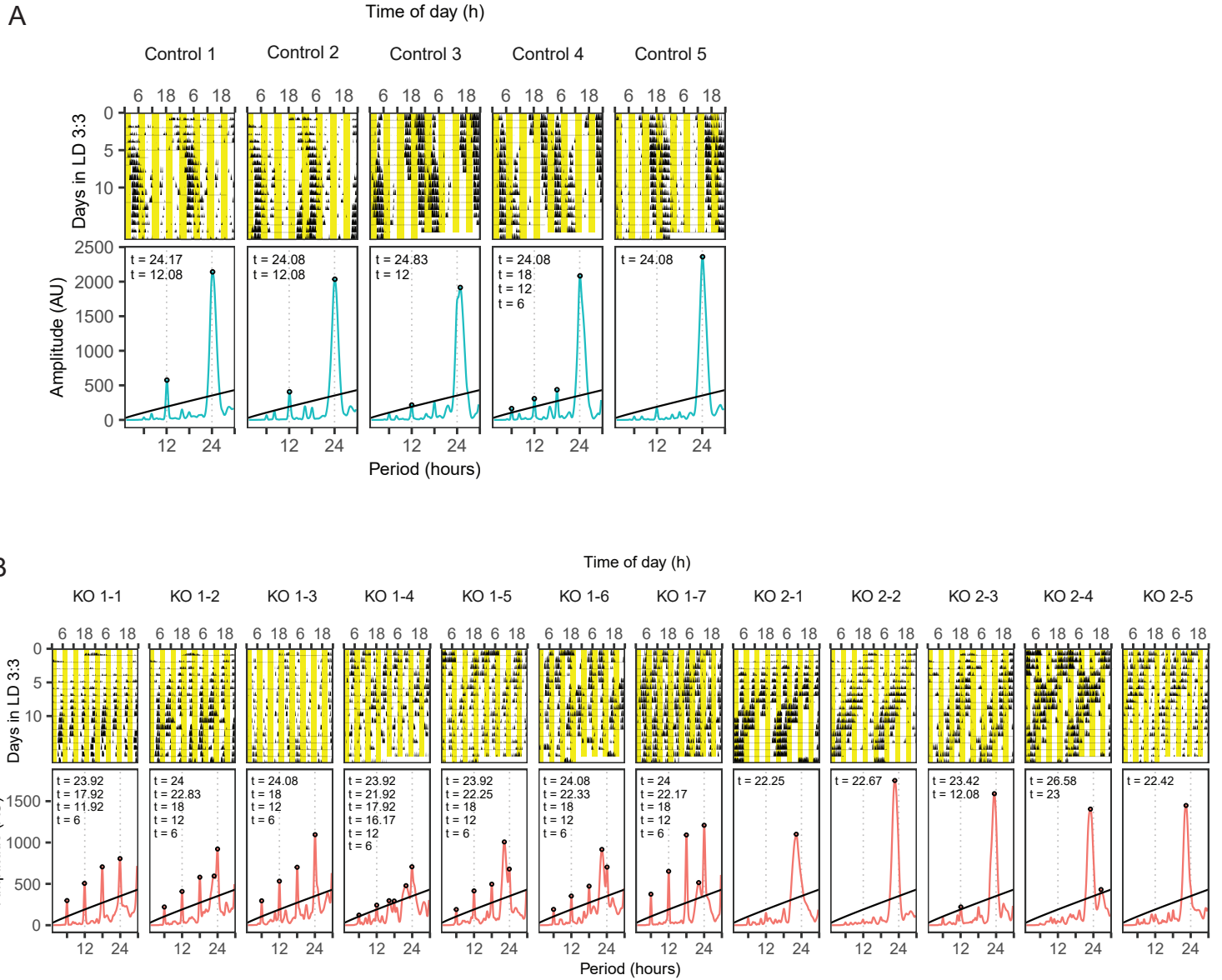


Figure S6

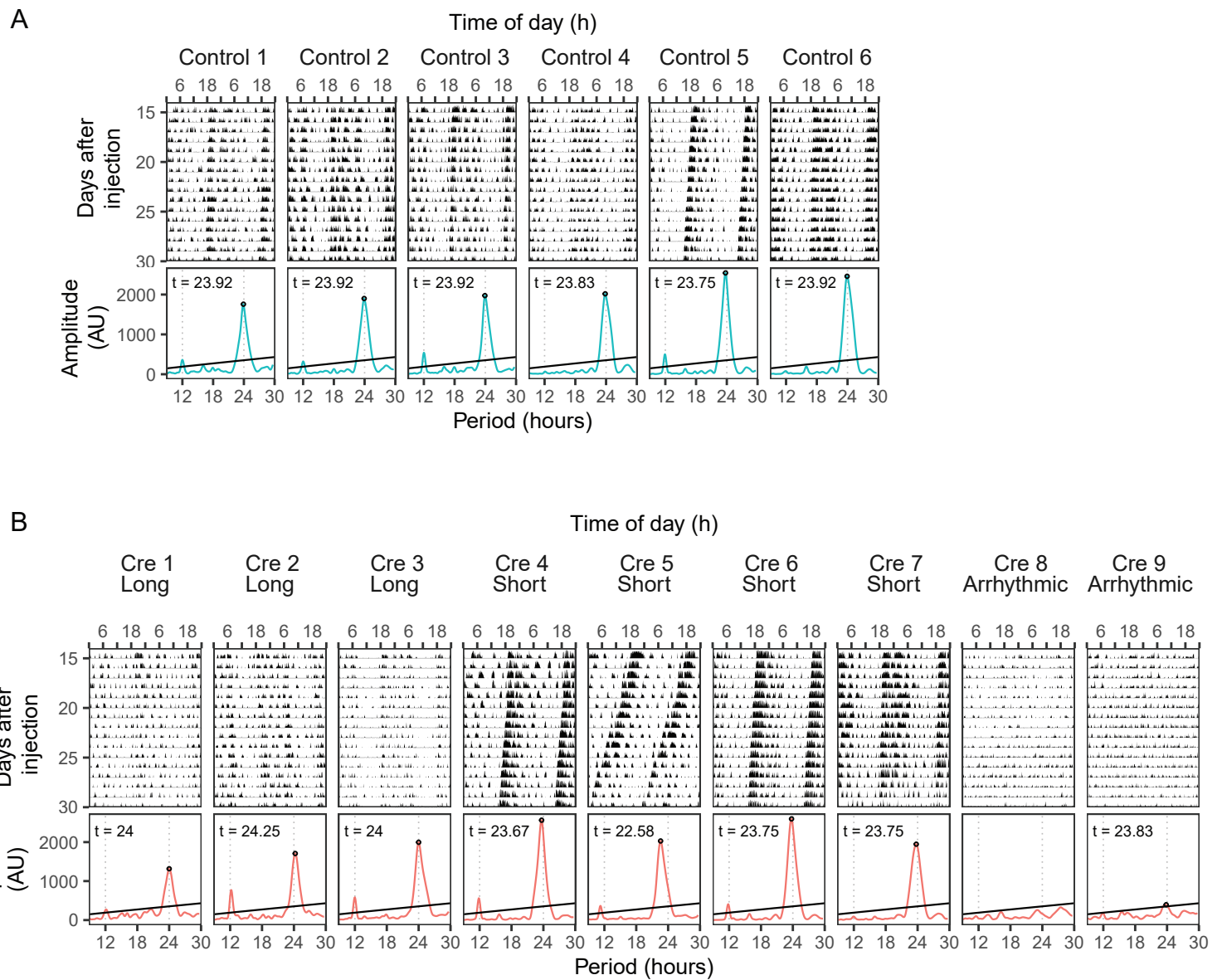


Figure S7

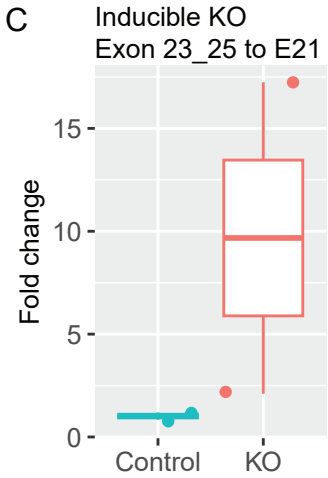
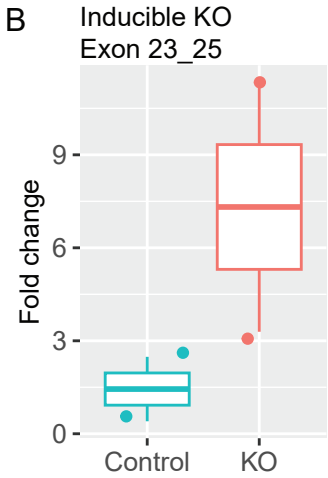
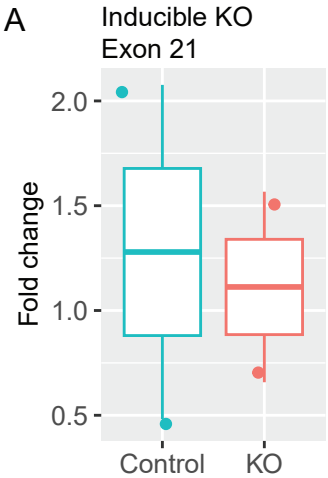


Figure S8

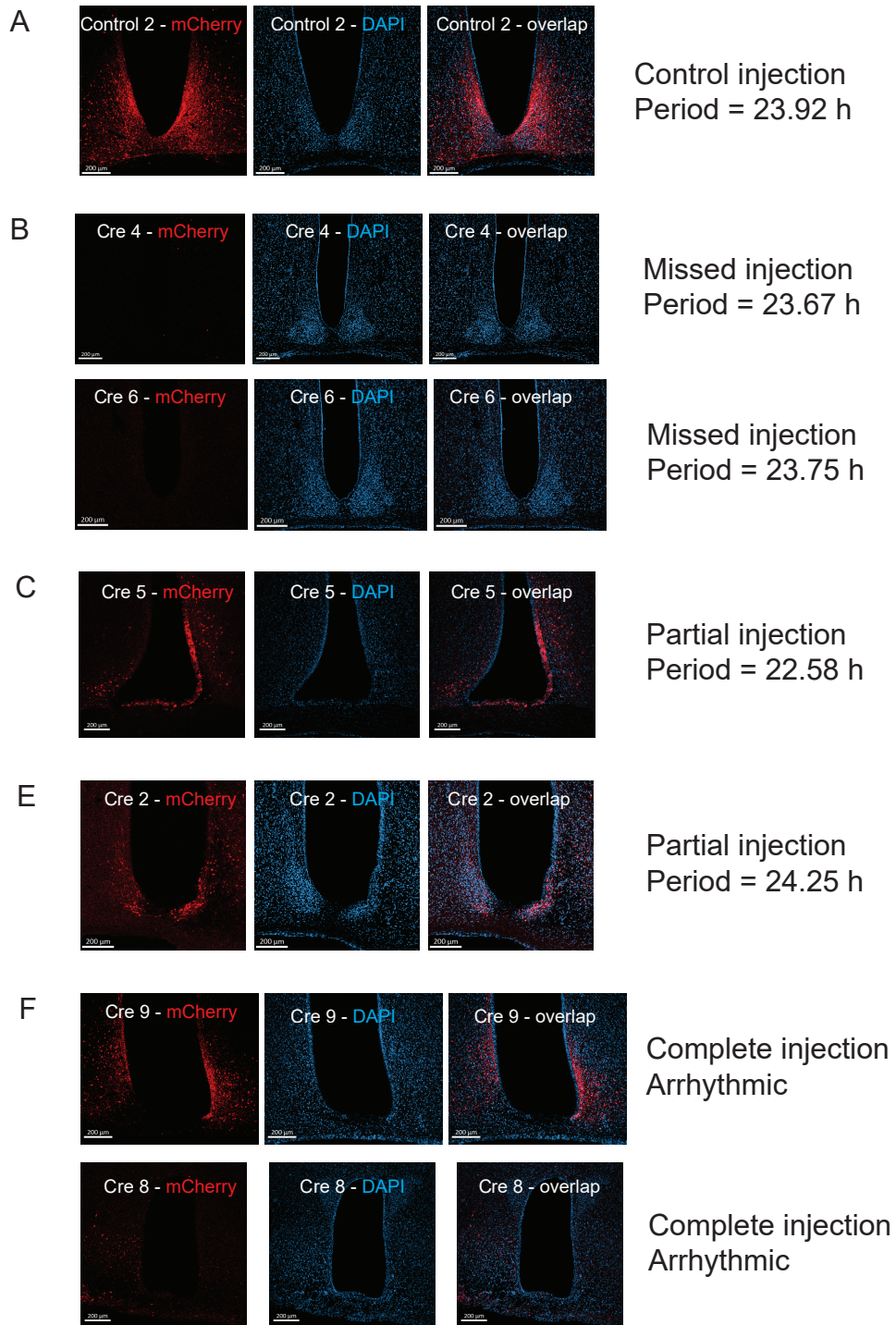


Figure S9

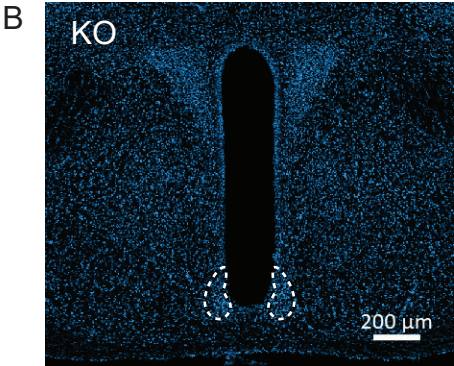
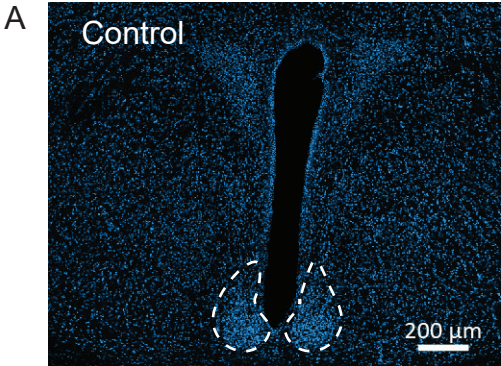
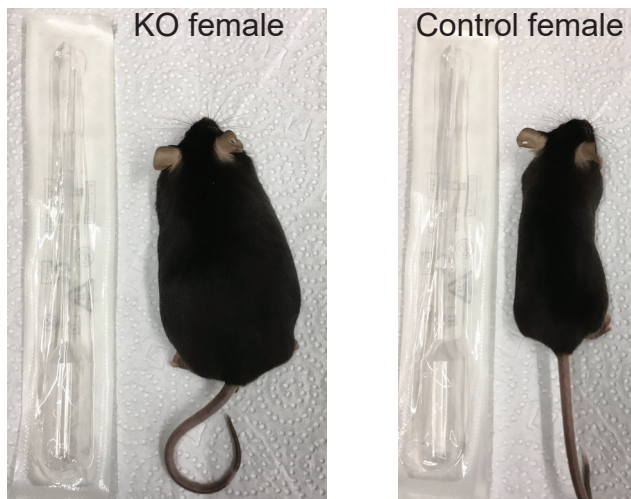


Figure S10

A



B

